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CANTOR COLBURN, LLP - PROTON
55 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

EXAMINER	
MURALIDAR, RICHARD V	

ART UNIT	PAPER NUMBER
2838	

DATE MAILED: 10/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/708,051	SPERANZA ET AL.	
	Examiner	Art Unit	
	Richard V. Muralidar	2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Note: the examiner has corrected the placement of the rejected claims 5, 15 and 26 from the previous action, which were inadvertently placed under the 35 U.S.C. 102 rejection section. The correct placement is under the 35 U.S.C 103 rejection section, as updated below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 8-14,18-25, and 27-32 are rejected under 35 U.S.C. 102[e] as being anticipated by Czajkowski et al [U.S. 6503649].

With respect to claim 1, Czajkowski discloses power electronics for an electrochemical cell system [col. 5 lines 40-64], the power electronics comprising: a first power converter [Fig. 1 converter system 40 in the first power conversion module 13; col. 6 lines 49-52] including: a plurality of interchangeable power converter modules [Fig. 1 modular converters 42; col. 8 lines 13-24], and a first motherboard configured to receive the plurality of interchangeable power converter modules [col. 7 lines 1-6- modular construction; though a circuit board is not mentioned, placing power electronics on circuit cards is standard in the industry]; wherein a power rating of the

first power converter is capable of being changed by adjusting a number of the interchangeable power converter modules attached to the first motherboard [Figs. 1 and 2; col. 8 lines 13-24; col. 6 lines 56-67 and col. 7 lines 1-6; col. 6 lines 16-21 the overall converter]. With respect to the motherboard/circuit board, it is implicitly understood from Fig. 1 or Fig 2 that the modules would be implemented in circuit cards given by the dashed outlines of each power conversion module 12 or 13. Additionally, col. 6 lines 65-67 and col. 7 lines 11-4 disclose that the modules are plug-ins and are hot swappable, which similarly indicate a circuit card/motherboard to be plugged into].

With respect to claims 2, 12, and 14, Czajkowski discloses a controller [Fig. 3 controller 20] configured to adjust a current output from the interchangeable power converter modules attached to the first/second motherboard [col. 9 lines 52-56].

With respect to claim 3, Czajkowski discloses a second power converter [Fig. 2 converter system 40 in the second power conversion module 12] including: a second motherboard configured to receive at least a portion of the plurality of interchangeable power converter modules [col. 7 lines 1-6; col. 8 lines 17-19 modular converters 42]; wherein a power rating of the second power converter is capable of being adjusted by changing a number of the interchangeable power converter modules attached to the second motherboard [Figs. 1 and 2; col. 8 lines 13-24; col. 6 lines 56-67 and col. 7 lines 1-6; col. 6 lines 16-21 the overall converter].

With respect to claim 4, Czajkowski discloses the controller is further configured to adjust a current output from the interchangeable power converter modules attached to the second motherboard [col. 9 lines 52-56].

With respect to claims 8 and 18, Czajkowski discloses the first DC output from the first half-module and the second DC output from the second half-module are controlled by the controller [col. 9 lines 52-56].

With respect to claims 9 and 19, Czajkowski discloses the first motherboard, the second motherboard [with respect to the motherboard/circuit board, it is implicit from Fig. 1 or Fig. 2 that the modules would be implemented in circuit cards given by the dashed outlines of each power conversion module 12 or 13], and the controller are mounted in a common power converter box [a common means of containing all the components are implicit- stand alone unit col. 1 lines 6-9].

With respect to claims 10, 20, and 27, Czajkowski discloses the controller is configured to receive signals from the interchangeable power converter modules attached to the first motherboard, the signals indicating at least one of: an output current, a temperature, a fuse status, an output voltage, an input voltage, and combinations including two or more of the foregoing [electrical parameters, temperature etc. col. 7 lines 15-19].

With respect to claim 11, Czajkowski discloses an electrochemical cell system [col. 5 lines 40-64], comprising: a first power source [Fig. 2 banked storage #1]; an electrochemical cell [Fig. 2 banked fuel cell stacks #1]; and a modular power electronics system [Fig. 1 modular converters 42; col. 8 lines 13-24] electrically connected between the first power source and the electrochemical cell, the modular power electronics system including: a first power converter [Fig. 2 banked dc to ac converters #1] adapted for conditioning electrical current flow between the first

power source and the electrochemical cell, the first power converter including: a plurality of interchangeable power converter modules [Fig. 1 modular converters 42; col. 8 lines 13-24], and a first motherboard configured to receive the plurality of interchangeable power converter modules; wherein a power rating of the first power converter is capable of being adjusted by changing a number of the interchangeable power converter modules attached to the first motherboard [Figs. 1 and 2; col. 8 lines 13-24; col. 6 lines 56-67 and col. 7 lines 1-6; col. 6 lines 16-21 the overall converter]. With respect to the motherboard/circuit board, it is implicit from Fig. 1 or Fig 2 that the modules would be implemented in circuit cards given by the dashed outlines of each power conversion module 12 or 13].

With respect to claim 12, Czajkowski discloses a second power source [Fig. 2 banked storage #2], wherein the modular power electronics system [Fig. 1 modular converters 42; col. 8 lines 13-24] is electrically connected between the second power source and the electrochemical cell; and wherein the modular power electronics system further includes: a second power converter [Fig. 2 banked dc to ac converters #2] adapted for conditioning electrical current flow between the second power source and the electrochemical cell, the second power converter including: a second motherboard configured to receive at least a portion of the plurality of interchangeable power converter modules; wherein a power rating of the second power converter is capable of being adjusted by changing a number of the interchangeable power converter modules attached to the second motherboard [Figs. 1 and 2; col. 8 lines 13-24; col. 6 lines 56-67 and col. 7 lines 1-6; col. 6 lines 16-21 the overall converter]. With

respect to the motherboard/circuit board, it is implicit from Fig. 1 or Fig 2 that the modules would be implemented in circuit cards given by the dashed outlines of each power conversion module 12 or 13].

With respect to claim 21, Czajkowski discloses the controller is in operable communication with a controller for the electrochemical cell [col. 6 lines 30-35 and 49-55; col. 7 lines 38-43].

With respect to claim 22, Czajkowski discloses a method of configuring power electronics for an electrochemical cell system, the power electronics including a first power converter, the method comprising: configuring the first power converter such that its power rating is adjustable by changing a number of interchangeable power converter modules attached to a first motherboard of the first power converter [the limitations of this Claim have been addressed by the preceding Claim arguments].

With respect to claims 23 and 25, Czajkowski discloses configuring a plurality of the interchangeable power converter modules [col. 8 lines 13-24] attached to the first motherboard such that an associated current output is adjustable using a single controller [col. 9 lines 52-56].

With respect to claim 24, Czajkowski discloses, the power electronics are housed within a power converter box and include a second power converter, the method further comprising: configuring the power converter box housing the first motherboard and the single controller such that a second motherboard may be included therein; and configuring the second power converter such that its power rating

is adjustable by changing a number of the interchangeable power converter modules attached to the second motherboard [the limitations of this claim have been addressed by the preceding claim arguments].

With respect to claims 28 and 30, Czajkowski discloses a second power converter including: at least a portion of the plurality of interchangeable power converter modules attached to the first motherboard, wherein a power rating of the second power converter is capable of being adjusted by changing a number of the interchangeable power converter modules attached to the first motherboard [the limitations of this claim have been addressed by the preceding claim arguments].

With respect to claim 29, Czajkowski discloses a second power source, wherein the modular power electronics system is electrically connected between the second power source and the electrochemical cell; and wherein the modular power electronics system further includes: a second power converter adapted for conditioning electrical current flow between the second power source and the electrochemical cell, the second power converter including: at least a portion of the plurality of interchangeable power converter modules attached to the first motherboard, wherein a power rating of the second power converter is capable of being adjusted by changing a number of the interchangeable power converter modules attached to the first motherboard [the limitations of this claim have been addressed by the preceding claim arguments, specifically Claim 13. All the converters modules are interconnected, so specifying which motherboard the modules are attached to does not functionally change the device's ability, as shown in Figs. 1, 2, and 3].

With respect to claim 31, [new] Czajkowski discloses that the electrochemical cell is an electrolysis cell [Abstract; it is known that fuel cells can be either of the electrochemical or electrolysis types; both serve the same purpose- to generate power].

With respect to claim 32, [new] Czajkowski discloses the plurality of interchangeable power converter modules receive input voltage from the first motherboard [see statement concerning motherboard in claim 1 and in arguments below. The converters receive power from the fuel cells, which can be on its own motherboard/chassis or combined with that of the converter], and provide programmable output voltage in parallel to the electrochemical cell [the connection between the converters and the fuel cell is parallel, the voltage is programmable through the action of the controller 20 in Fig.1- col. 6 lines 56-68 and col. 7 lines 1-6].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103[a] which forms the basis for all obviousness rejections set forth in this Office action:

> [a] A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-7, 15-17, and 26 are rejected under 35 U.S.C. 103[a] as being unpatentable over Czajkowski et al [US 6503649] in view of Nomura et al [2001/0012207].

With respect to claims 5, 15, and 26, Czajkowski discloses the first power converter is one of an AC-to-DC converter and a DC-to-DC converter, and the second

power converter is one of an AC-to-DC converter and a DC-to-DC converter [col. 8 lines 13-24; modular converter 42 comprised of dc-dc converters]. Czajkowski does not disclose the inner components of the modules.

Nomura teaches the inner components of the modules, namely the first chopping circuit [Fig. 1 H bridge inverter 58], the first transformer [Fig. 1 transformer 31], and the first rectifier [Fig. 1 rectifying diodes 33-36]; and a second half-module [the second half module would be in any of the modules 1-n shown in Czajkowski Fig. 3] including: a second chopping circuit configured to receive a second DC input and provide a second AC output; a second transformer configured to adjust a power of the second AC output and provide a second transformed AC output; and a second rectifier configured to receive the second transformed AC output and provide a second DC output.

Czajkowski and Nomura are analogous dc-dc power converters. At the time of the invention it would have been obvious to one of ordinary skill in the art to specify Nomura's dc to ac to dc converter in conjunction with Czajkowski for the benefit of clearly showing the internal workings of Czajkowski's invention. This particular structure for dc to ac to dc converters where the dc input is first inverted, transformed, then rectified again is the standard state of dc to ac to dc converters and is notoriously well known in the art.

With respect to claims 6 and 16, Czajkowski teaches each power converter module in the plurality of power converter modules includes: a first chopping circuit configured to receive a first DC input and provide a first AC output; a first transformer configured to adjust a power of the first AC output and provide a first transformed AC

output; and a first rectifier configured to receive the first transformed AC output and provide a first DC output. Since Czajkowski anticipates dc-dc converters in col. 8 lines 13-24; all of these components are implicit because dc-dc converter circuitry is well known in the art. However, Czajkowski does not go into any detail concerning the individual converter components.

Nomura teaches a first chopping circuit [Fig. 1 H bridge inverter 58] configured to receive a first DC input and provide a first AC output; a first transformer [Fig. 1 transformer 31] configured to adjust a power of the first AC output and provide a first transformed AC output; and a first rectifier [Fig. 1 rectifying diodes 33-36] configured to receive the first transformed AC output and provide a first DC output.

Czajkowski and Nomura are analogous dc-dc power converters. At the time of the invention it would have been obvious to one of ordinary skill in the art to specify Nomura's dc to ac to dc converter in conjunction with Czajkowski for the benefit of clearly showing the internal workings of Czajkowski's invention. This particular structure for dc to ac to dc converters where the dc input is first inverted, transformed, then rectified again is the standard state of dc to ac to dc converters and is notoriously well known in the art.

With respect to claims 7 and 17, Czajkowski teaches each power converter module in the plurality of power converter modules [col. 8 lines 13-24], and that they consist of smaller modules [Fig. 2 modules #1-n, dc to ac converters], but does not teach the inner components of the modules.

Nomura teaches a first chopping circuit [Fig. 1 H bridge inverter 58] configured to receive a first DC input and provide a first AC output; a first transformer [Fig. 1 transformer 31] configured to adjust a power of the first AC output and provide a first transformed AC output; and a first rectifier [Fig. 1 rectifying diodes 33-36] configured to receive the first transformed AC output and provide a first DC output. The second half module's components are identical to the first.

Czajkowski and Nomura are analogous dc-dc power converters. At the time of the invention it would have been obvious to one of ordinary skill in the art to specify Nomura's dc to ac to dc converter in conjunction with Czajkowski for the benefit of clearly showing the internal workings of Czajkowski's invention. This particular structure for dc to ac to dc converters where the dc input is first inverted, transformed, then rectified again is the standard state of dc to ac to dc converters and is notoriously well known in the art.

Response to Arguments

Applicant's arguments filed 6/22/2006 have been fully considered but they are not persuasive.

Applicant argues on pages 12 and 13 of **REMARKS/ARGUMENTS** that Czajkowski [U.S. 6503649] does not mention a circuit board/mother board, on which to contain the power converter modules. A motherboard, as used in this context, is any chassis or platform that supports electronics, modules, or any other kind of equipment. The applicant is correct in pointing out that Czajkowski does not expressly state that the converter modules 42 shown in Fig. 1 are not on a circuit board or a motherboard. However, it is clear that these converter modules must implicitly be supported by something. Whatever shape or form that something takes will fit the *broad and general definition* of a motherboard. The examiner stands by the original rejection that given the existence of the converter modules themselves, and the real world necessity of requiring a place to mount them, that a motherboard is implicit. This is a common-sense approach to real world practical applications of Czajkowski's converter modules. Col. 6 lines 65-67 and col. 7 lines 11-4 disclose that the modules are plug-ins and are hot swappable, which similarly indicate a circuit card/motherboard to be plugged into. The examiner additionally points out that the dashed lines of Fig. 1 or 2 serve as an adequate suggestion as to how to divide/implement the motherboard. Applicant further argues that for implicit reasoning to adequately support an anticipatory rejection, the implied structure must necessarily be present in the prior art reference. The examiner

points out that if the structure were actually present, then it would be expressly present, thus forgoing the need to use implicit reasoning.

Applicant argues on page 14 that Czajkowski's power converter is adapted for conditioning electrical current flow between the storage cell/fuel cell unit combination and the power load, which is different from the claimed "...a first power converter adapted for conditioning electrical current flow between the first power source and the electrochemical cell..." The examiner has previously cited in Czajkowski that the first power source is the storage unit 36 of Fig. 1; and that electrochemical cell is the fuel cell stacks 30. Col. 6 lines 45-47 states that "... storage system 36 buffers out load induced transients and surges or deficits from the fuel cell unit 30..." The examiner notes that buffering load-induced transients is essentially the same thing as conditioning electrical current flow. Both are interpreted as acting to reduce power flow ripple.

Applicant argues on page 15 that Czajkowski does not have "...configuring the first power converter such that its power rating is adjustable by changing a number of interchangeable power converter modules attached to a first motherboard of the first power converter." The examiner previously cited [Figs. 1 and 2; col. 8 lines 13-24; col. 6 lines 56-67 and col. 7 lines 1-6; col. 6 lines 16-21 the overall converter] as meeting this limitation. The overall power converter is modular and scalable *at all levels*. Multiple converter modules 40 may be added (or subtracted) to the overall system as shown in Fig. 3; the addition of each unit will act to change the power output of that overall converter [shown at the 120 VAC OUT terminal].

Applicant argues on page 15 that Czajkowski lacks disclosure of "...first DC output from the first half-module and the second DC output from the second half-module are controlled by the controller." Specifically, that Czajkowski discloses **dc-ac** converters instead of **dc-dc** converters [emphasis added]. The examiner points out that both types of converters are widely available and well known in the art. If one desires to supply power to a DC load, it is understood that dc-dc converters can readily be used. The same reasoning applies for ac loads. The use of dc instead of ac loads does not create a patentable distinction for the applicant's power supply over Czajkowski's power supply. Additionally, col. 6 lines 49-52 clearly states "the output 11 can provide **BOTH** ac and dc electrical current output through outputs from converter system 40...which may include dc-ac as well as **dc-dc converters**..."

Applicant's remaining arguments on page 16 depend upon arguments that have already been satisfied above.

This action is a **final rejection** and is intended to close the prosecution of this application. Applicant's reply under 37 CFR 1.113 to this action is limited either to an appeal to the Board of Patent Appeals and Interferences or to an amendment complying with the requirements set forth below.

If applicant should desire to appeal any rejection made by the examiner, a Notice of Appeal must be filed within the period for reply identifying the rejected claim or claims appealed. The Notice of Appeal must be accompanied by the required appeal fee.

If applicant should desire to file an amendment, entry of a proposed amendment after final rejection cannot be made as a matter of right unless it merely cancels claims

or complies with a formal requirement made earlier. Amendments touching the merits of the application which otherwise might not be proper may be admitted upon a showing a good and sufficient reasons why they are necessary and why they were not presented earlier.

A reply under 37 CFR 1.113 to a final rejection must include the appeal from, or cancellation of, each rejected claim. The filing of an amendment after final rejection, whether or not it is entered, does not stop the running of the statutory period for reply to the final rejection unless the examiner holds the claims to be in condition for allowance. Accordingly, if a Notice of Appeal has not been filed properly within the period for reply, or any extension of this period obtained under either 37 CFR 1.136(a) or (b), the application will become abandoned.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard V. Muralidar whose telephone number is 571-272-8933. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl D. Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RVM
10/17/2006

KARL EASTHOM
SUPERVISORY PATENT EXAMINER